



# 40 STEAM Programs in 40 Minutes

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KDLA 2013 Summer Reading Conference

# Today's Goal

- Define STEAM
- Simple and engaging programs for all ages
- 8 programs per category
- Family Festival Nights
- Hands-on Q&A following presentation...

# Science

# T

# Technology

# E

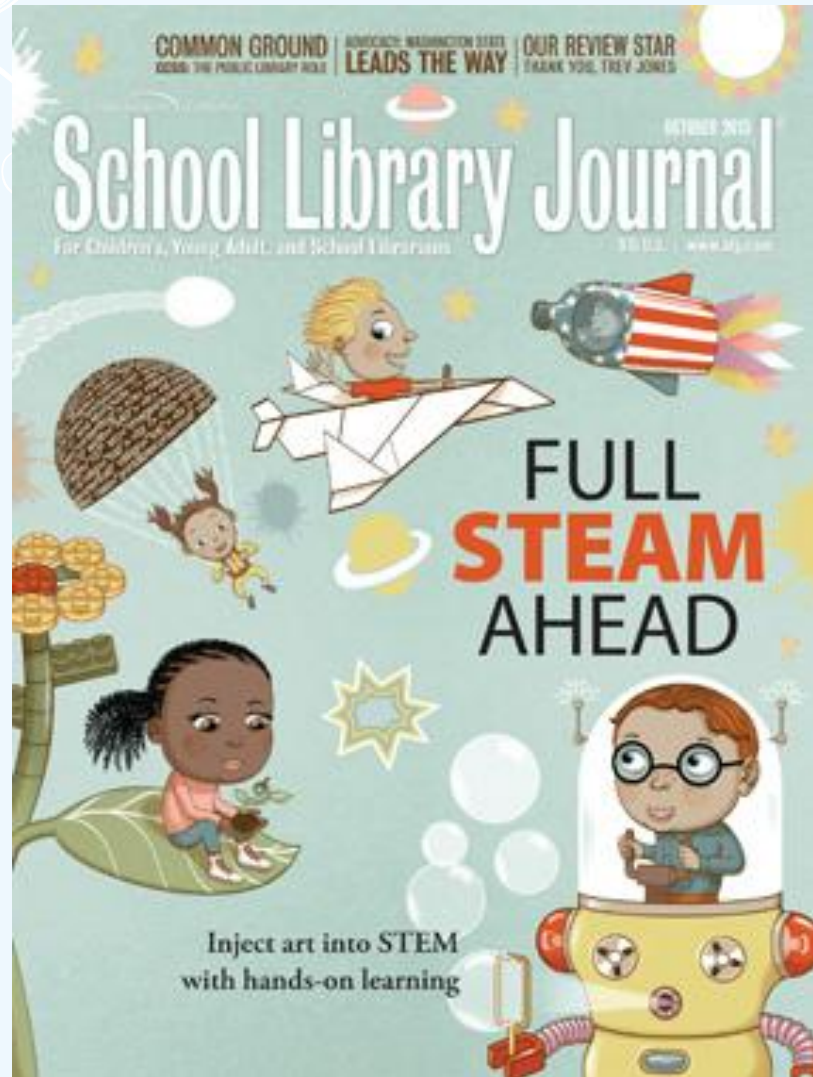
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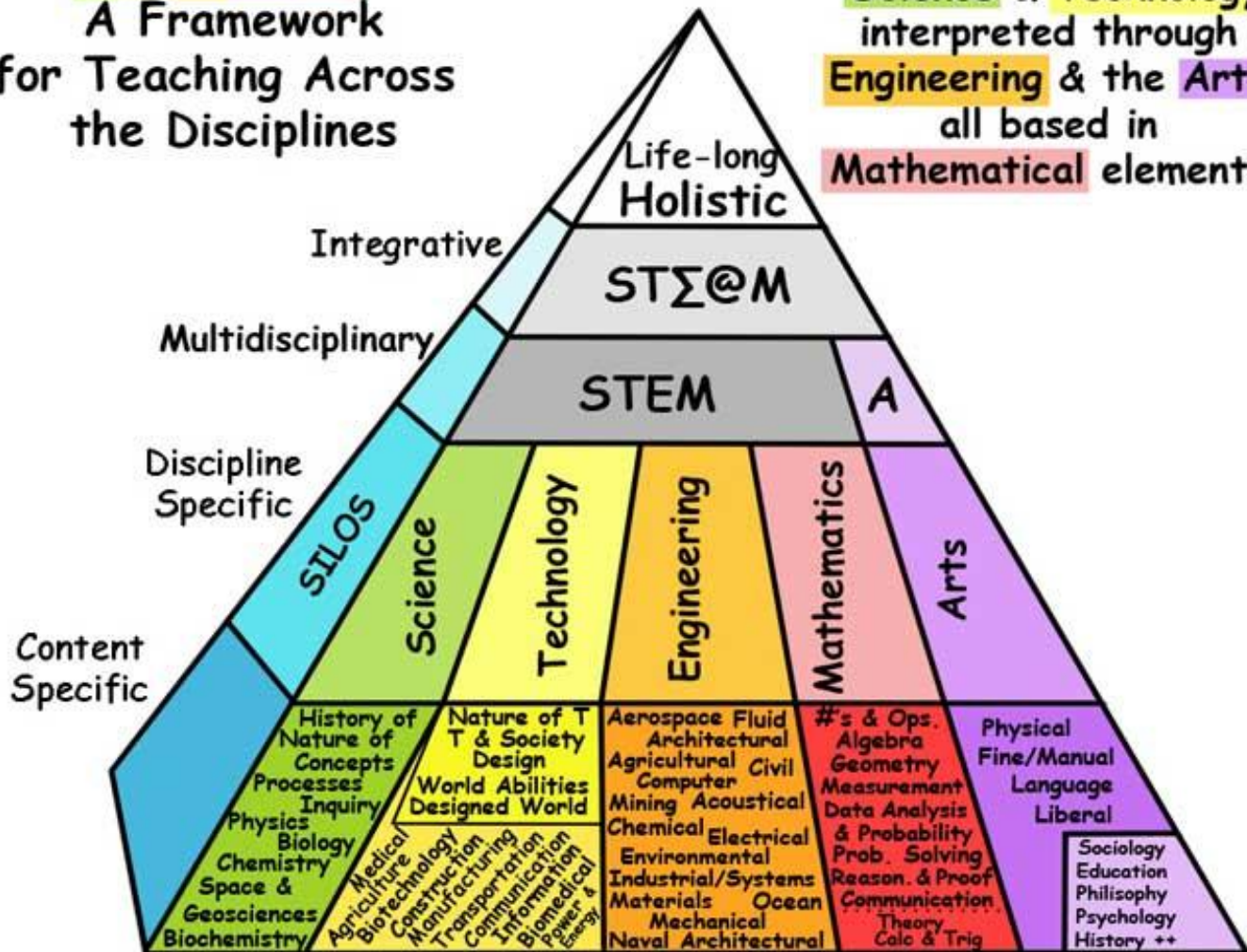
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# STΣ@M:

A Framework  
for Teaching Across  
the Disciplines

STΣ@M =  
Science & Technology  
interpreted through  
Engineering & the Arts,  
all based in  
Mathematical elements.



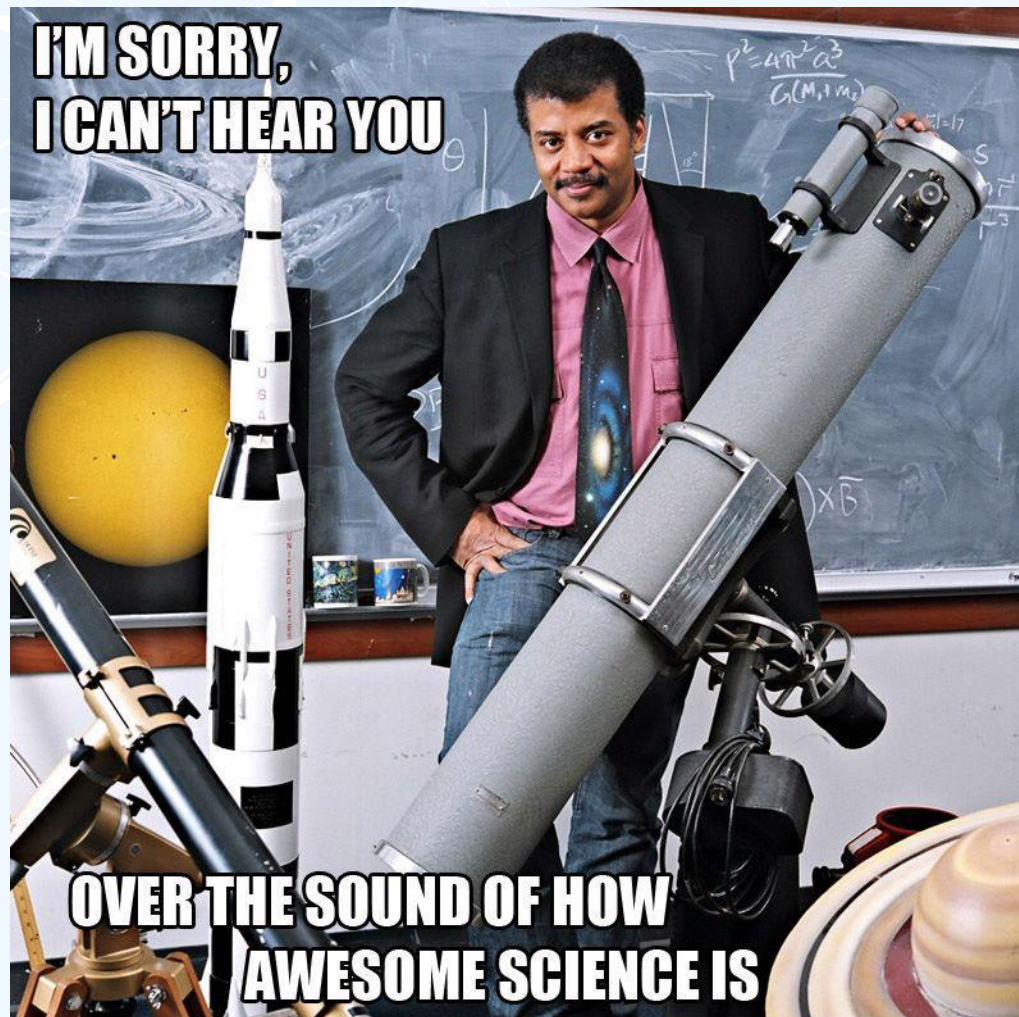
www.STEAMedu.com

C.2006-2011 G. Yakman

<http://steamconnect.org/>

Boone County Public Library

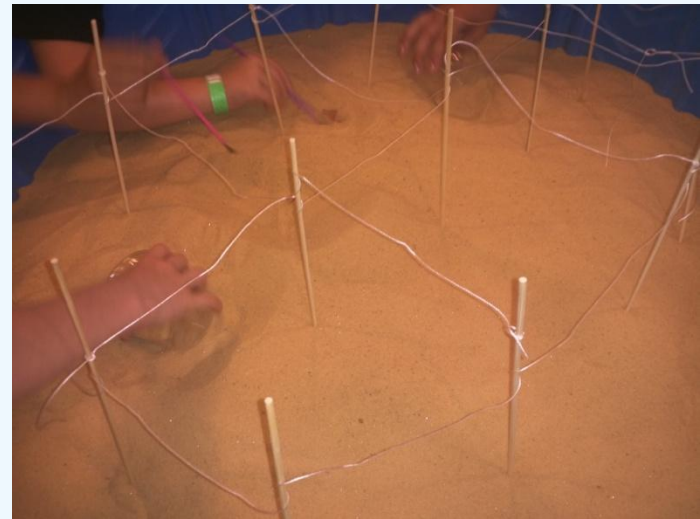
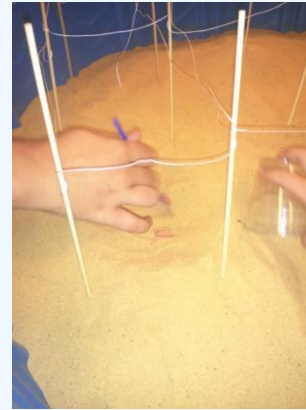




## 8 Super SCIENCE Programs...

# 1.) Archaeology

- Grades 3-8
- Explaining how systematically archaeologists dig up excavation sites.



## 2.) DNA

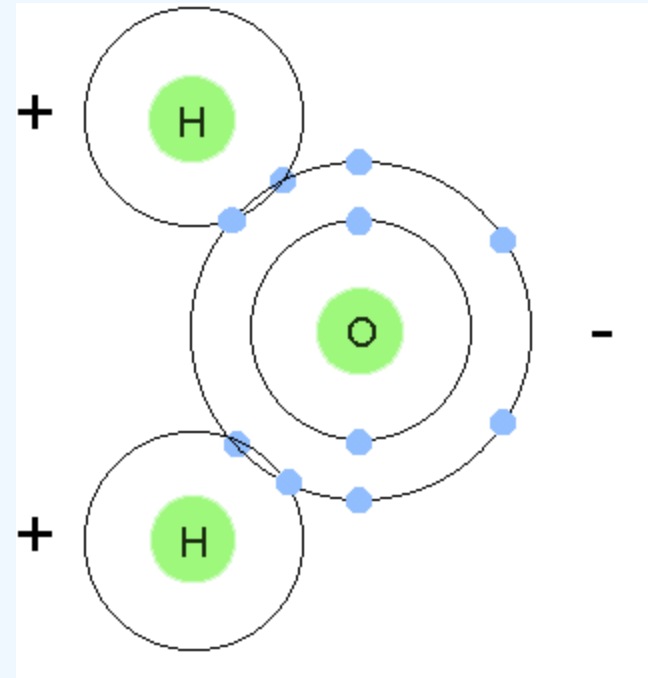
- Middle & High School
- Candy DNA Model
- Phenotype vs. Genotype with SpongeBob
- DNA Extraction:  
<http://www.youtube.com/watch?v=hOpu4iN5Bh4>



- <http://teach.genetics.utah.edu/content/begin/dna/Have%20Your%20DNA%20student.pdf>

# 3.) Do You Know H<sub>2</sub>O?

- Grades 3-8
- Water Molecule
  - With Styrofoam
  - Older groups: explain why molecule is H<sub>2</sub>O (electrons!)
- Water Experiments





- Grades 4-7
- Human body activities
- Learn how tendons move hands
- Brain
- Bones
- Digestive system

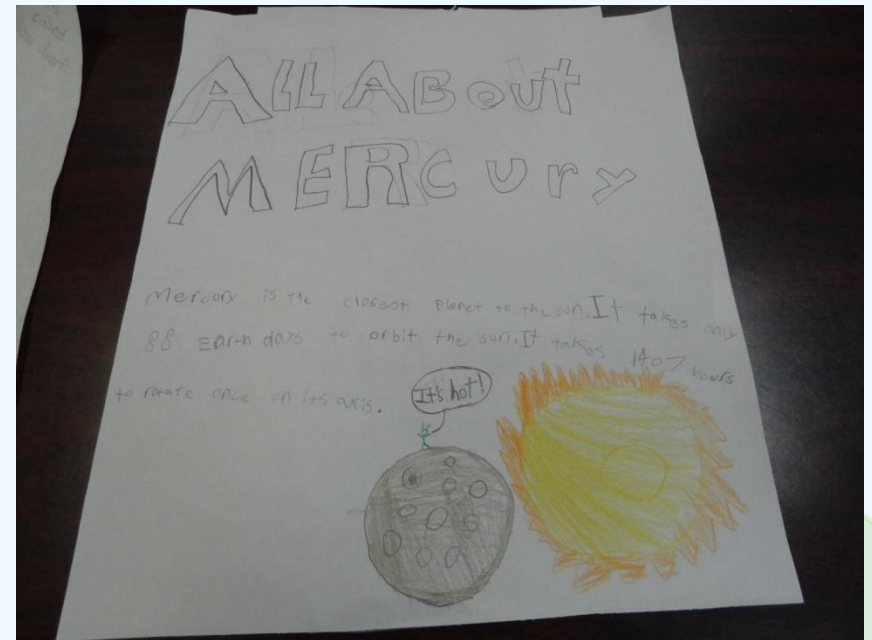
## 5.) Seed Balls

- All ages
- Earth Science
- Gardening fun!
- Clay helps to protect seeds and conserve moisture, soil provides nutrients, seeds stimulated when it rains.



## 6.) Space

- All ages
- LPI Explore programs
  - <http://www.lpi.usra.edu/education/explore/>
- NASA Apps
- Expose children and teens to the wonders of space science.



# 7.) Chemistry in a Bag

- Cincinnati Museum Center's Programs-on- Wheels
- Middle & High School
- Take home activity: DIY Slime





# 8.) Paranormal Activity

- Teen Ghost Walk
- Partner with local history departments and PINK (Paranormal Investigators of NKY)
- Science Components:
  - Temperature Reading
  - Barometric Pressure
  - Electromagnetic Reading
  - Shadows







## 8 Terrific TECH Programs...

# 1.) Brush 'Bots

- DIY Robot
- Grades 4-8
- [www.makershed.com](http://www.makershed.com)
- STEAM Components:
  - Science
  - Technology



## 2.) Coder Camp

- All ages
- High school students can lead workshops for K-8
- <http://code.org/learn/codecademy>

- STEAM Components

- Technology
- Math
- Art



**will.i.am**

Musician/The Black Eyed Peas and  
Entrepreneur

***“Here we are, 2013, we ALL depend on technology to communicate, to bank, and none of us know how to read and write code. It's important for these kids, right now, starting at 8 years old, to read and write code.”***

# 3.) DIY Video Games

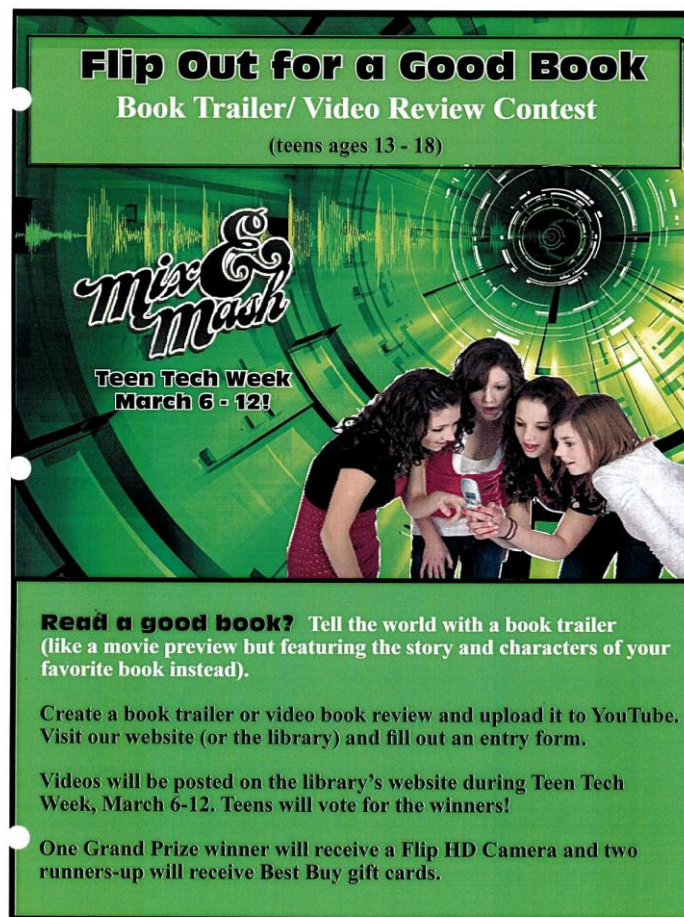
- [www.sploder.com](http://www.sploder.com)
- Grades 2-5 or 4-8
- Flash-based; no downloads needed
- Free!
- Weekly contests will highlight and publish best original games.





## 4.) Book Trailers

- Middle & High School
- Video Editing
- Microsoft Movie Maker
- Instagram or Vine?
- STEAM Components
  - Technology
  - Art

A poster for a book trailer contest. The top section has a green background with the title 'Flip Out for a Good Book' in bold white letters, followed by 'Book Trailer/ Video Review Contest' and '(teens ages 13 - 18)'. Below this is a circular graphic with a green and yellow color scheme, featuring the text 'Mix & Mash' in a stylized font and 'Teen Tech Week March 6 - 12!' in a smaller font. A photograph of four teenagers looking at a smartphone is positioned to the right of the circular graphic. The bottom section of the poster has a green background with white text providing details about the contest, including instructions on how to create a book trailer, where to upload it, and the prizes for winners.

**Flip Out for a Good Book**  
Book Trailer/ Video Review Contest  
(teens ages 13 - 18)

*Mix & Mash*  
Teen Tech Week  
March 6 - 12!

**Read a good book?** Tell the world with a book trailer (like a movie preview but featuring the story and characters of your favorite book instead).

Create a book trailer or video book review and upload it to YouTube. Visit our website (or the library) and fill out an entry form.

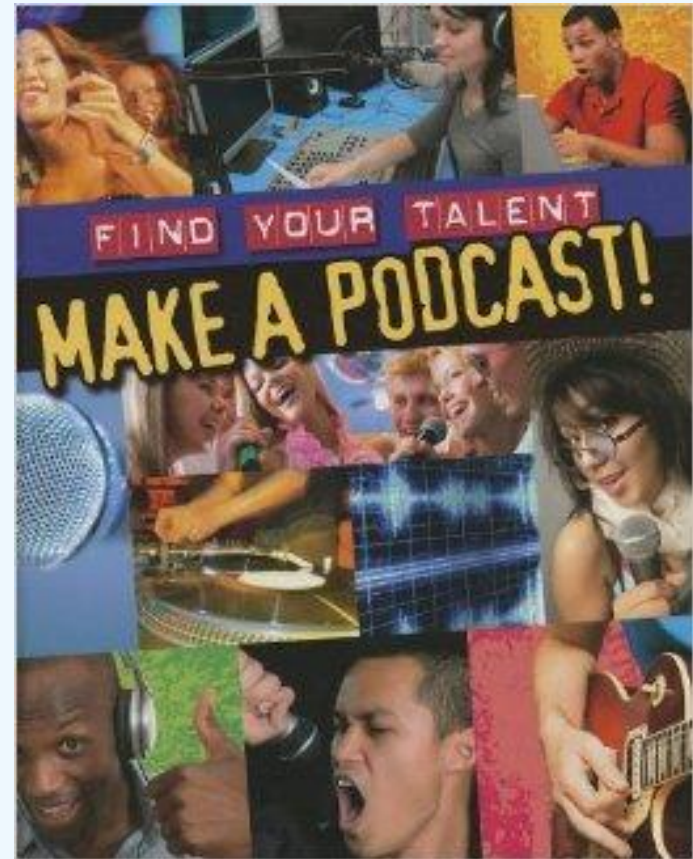
Videos will be posted on the library's website during Teen Tech Week, March 6-12. Teens will vote for the winners!

One Grand Prize winner will receive a Flip HD Camera and two runners-up will receive Best Buy gift cards.



# 5.) Podcasting

- High School
- Sound Editing
- Audacity software
- Great for TAG's!
- STEAM Components
  - Technology
  - Art



## 6.) Computers Inside Out

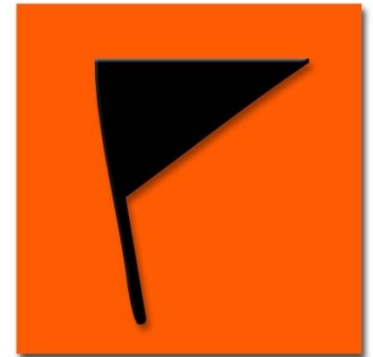
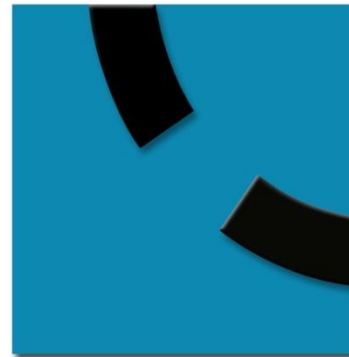
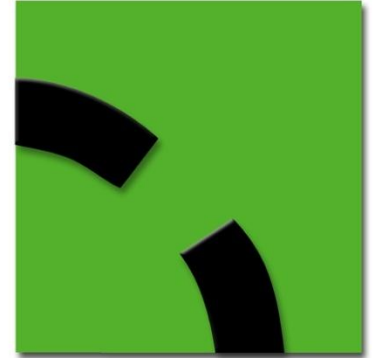
- Middle and High School
- Help build a computer from recycled parts to be donated to the Homeward Bound Shelter for homeless teens in NKY.
- *Approximately 220 million tons of E-Waste is generated annually in the U.S.*
- **Friday, November 15, 2013/ America Recycles Day**

[www.americarecyclesday.org](http://www.americarecyclesday.org)



# 7.) Geocaching

- All Ages
- Great family program
- Partner with local parks
- Don't need expensive equipment: can use tablets and smart phones with GPS and offline Google Maps



**GEOCACHING.COM**

# 8.) App-y Hour

~ Come & Discuss Your Favorite APPs for Smartphones & other devices! ~

Learn!

Share!

APPy  
Hour

Every  
2nd Thursday  
of the Month  
@ 7 PM

in the  
Conference  
Room

~ Light Refreshments Provided by the Friends of Freeman ~



**Information for Persons with Disabilities:** Harris County Public Library will make reasonable accommodations for people with disabilities who are interested in attending library programs. To make a request, notify the Branch Librarian two working days in advance of the program.





## **8 Engaging ENGINEERING Programs...**

Boone County Public Library

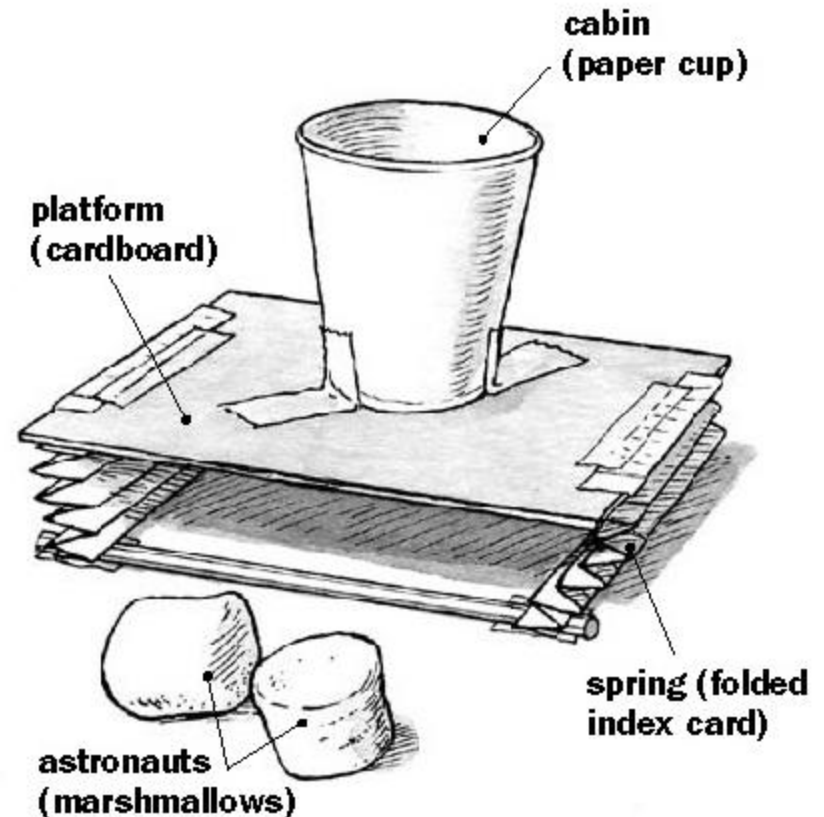


# 1.) Rube Goldberg Machine

- Middle & High School
- Create a machine that completes a simple task in a more complicated fashion.
- Work together as a team to engineer a machine (series of simple machines)
- BCPL Rube Goldberg Machine:  
<http://www.youtube.com/watch?v=qbLMNw4Hdv0>
- Simple examples on YouTube:
  - <http://www.youtube.com/watch?v=dFWHbRApS3c>
  - [http://www.youtube.com/watch?v=PQ\\_Y545MFpc](http://www.youtube.com/watch?v=PQ_Y545MFpc)
  - <http://www.youtube.com/watch?v=UMOEFlso4wM>
  - <http://www.youtube.com/watch?v=eSyCDyNf5K4>

## 2.) Lunar Landers

- Grades 3-12
- Alternative Program:  
The Great Egg Drop
- Learning the importance of balance and ingenuity for creating moon landers for astronauts.



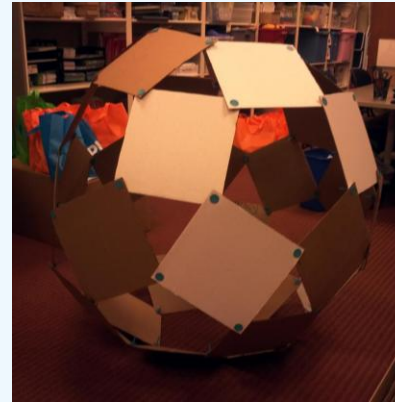
## 2.) Rockets!

- Grades 3-8
- Aerodynamics, force, design
- Tea Rocket - fire
- PVC pipe Rocket Launcher
- Balloon Rockets



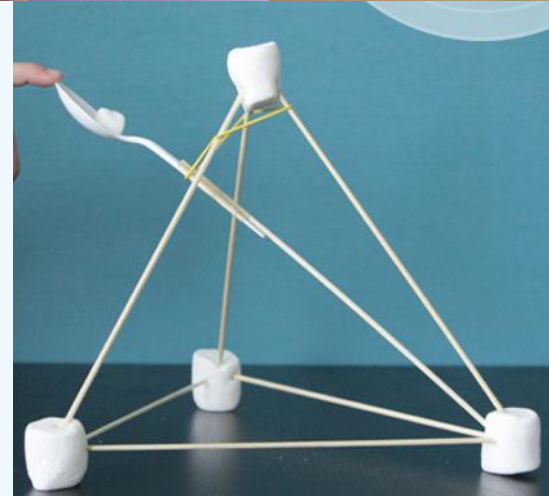
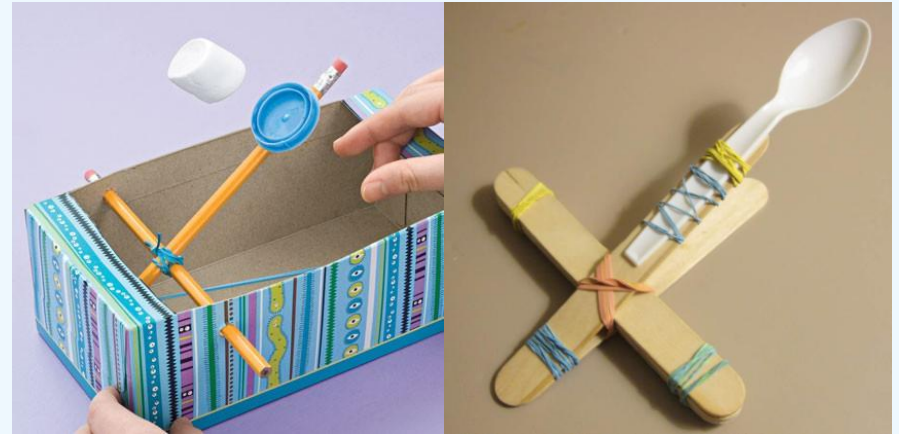
# 3.) Monumental Creations

- Grades 3-5
- STEAM Components
  - Engineering
- Makedo: <http://mymakedo.com/>
- Marshmallow architecture
- Geodesic Dome:
  - [http://www.pbs.org/wgbh/buildingbig/educator/act\\_geodesic\\_ho.html](http://www.pbs.org/wgbh/buildingbig/educator/act_geodesic_ho.html)
  - <http://www.youtube.com/watch?v=jYfszzzZg1c>



# 4.) Marshmallow Catapults

- Grades 3-8
- Create different types of catapults and test them out.
- Levels, force, distance, measurements





## 5.) Mentos & Soda Pop

- Grades 3-8
- Fizzy Fun - could also incorporate vinegar & baking soda experiments
- Using PVC pipe, teams can create a super Mentos drop.
  - <http://www.stevespanglerscience.com/lab/experiments/mentos-soda-popdrop>



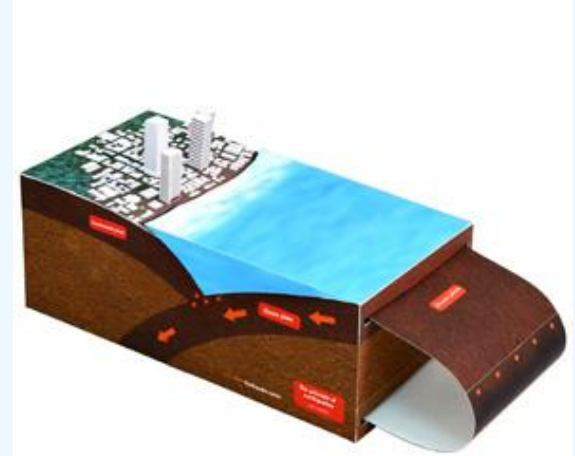
## 6.) Trash to Treasure

- Spend less money by upcycling old stuff to create something new.
- Alternative Program: FrankenToys



# 7.) Earthquake Proof Structures

- Free papercrafts downloads at Canon
- <http://cp.c-ij.com/en/contents/1006/>
- Scientific American Activity: Lego Sky Scrapers
- **Key concepts:**  
Engineering  
Architecture  
Physics  
Earthquakes



# 8.) Minecraft

- Grades 4+
- Check tech specs!
- ***Could Minecraft be the next great engineering school?***

– *Yahoo Finance*, Nov 30, 2012







## 8 Awesome ART Programs...

Boone County Public Library



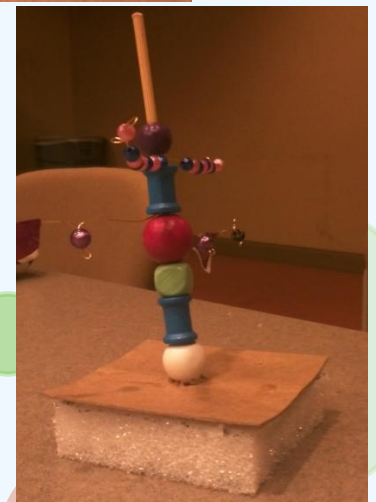
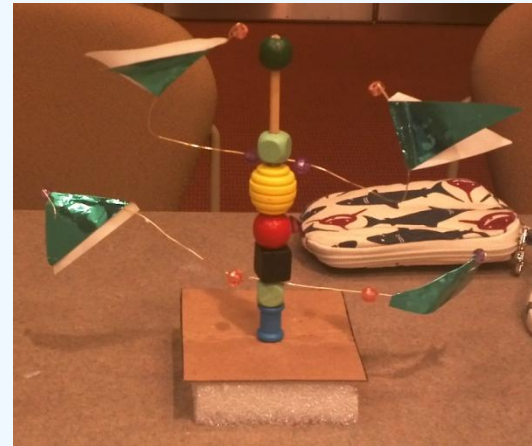
# 1.) Pointillism

- Grades 3-12
- Brain science – how colors are processed in the brain
- Work in teams to create large pieces of artwork to be displayed



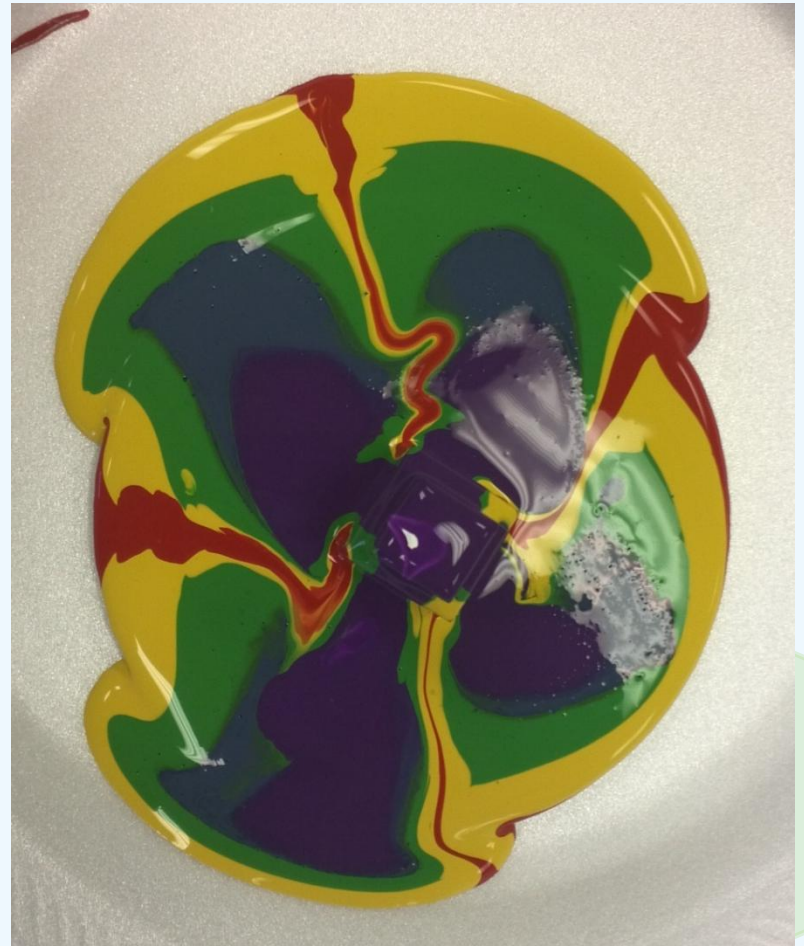
## 2.) Kinetic Sculpture

- Middle School
- Art and engineering
- Trial & error involved in creating an art piece that moves



# 3.) Tall Paintings

- Grades K-12
- STEAM Components
  - Art
  - Science
- Artist: Holton Rower



## 4.) Art Sculptures

- Grades 3-12
- cardstock cut into 1" x 11" strips, cardstock for base, glue sticks
- pool noodle cut to approximately 3" height, chenille stems, paper (for flags, etc.)





## 5.) Art Shrines

- Grades 3-8
- Can be whatever topic you choose.
- Provided quotes from books & about books
- Kids have freedom to design their own shrine.





## 6.) Pendulum Painting

- All ages
- Discuss gravity, motion
- PVC pipe construction to create pendulum paint art.
  - <http://teachertombsblog.blogspot.com/2010/04/pendulum-painting.html>
- Could use with Pendulum Challenge from PBS Kids
  - <http://pbskids.org/zoom/activities/sci/pendulumchallenge.html>



# 7.) Edible Art

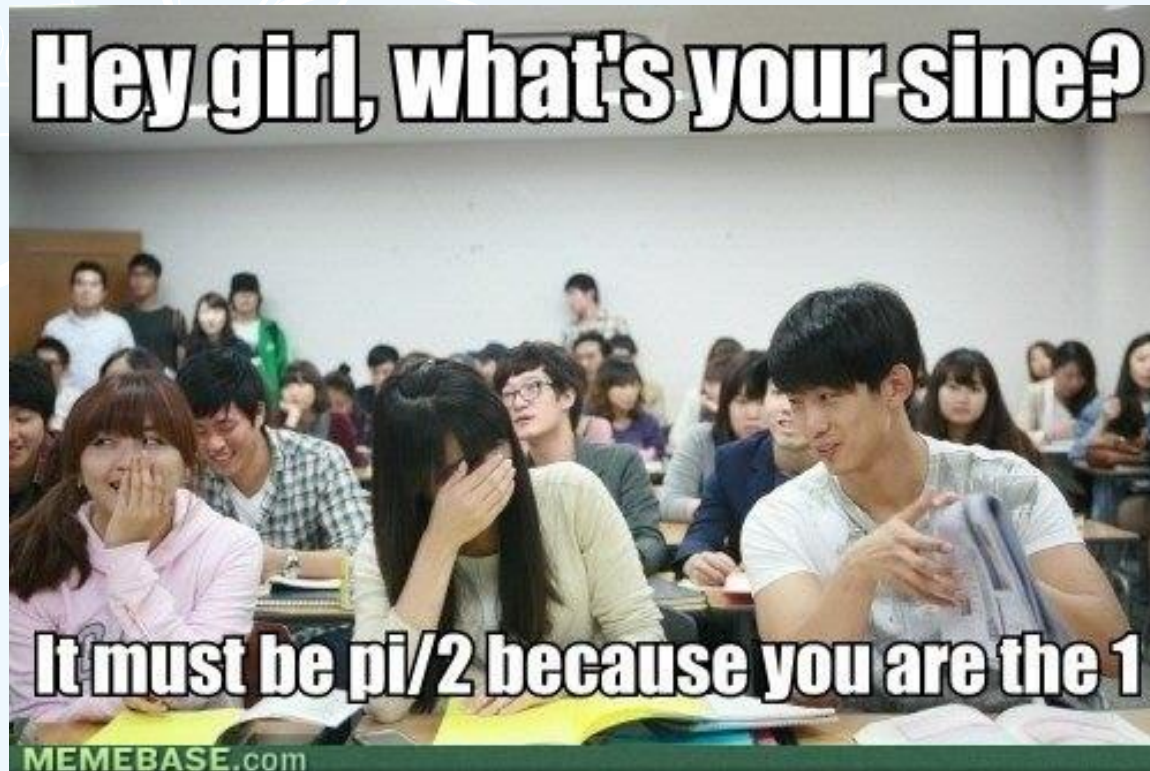
- Great for all ages
- Mimic iconic images from famous masterpieces, books, or video games
- More ingredients = More creative art!



## 8.) Student Art Showcase

- Partner with local schools and art teachers to highlight student created masterpieces
- All ages! Great holiday program!
- Students gain experience with selling works.





## 8 Mega MATH Programs...



# 1.) Pi Day

- Middle & High School
- STEAM Components:
  - Math
- *How I wish I could calculate pi!* to remember the first seven numbers of pi:  
3.141592





## 2.) Candy Casino


- Middle & High School
- Poker & Blackjack
- Learning about odds, probability, addition



# 3.) Gold Rush

- Grades K-5, but could work with Middle School
- Supply & Demand, Measurements, Inflation
- Pan for gold and determine how much money you made



Pan, for gold		1849	2012
		\$15.00	\$440

## 4.) Mario Party

- All ages, but best with middle school
- Teens form teams, 2-3 players, and move along Monopoly-like board
- Compete in mini-games focused on learning how to invest money to gain net worth.



## 5.) Life-Size Life

- Middle & High School
- Re-create a Life game board in the library.
- Teens learn about budgets, real life decision-making, how loans work.



**Your buddies  
crash your car.  
Pay \$5,000 if not  
insured.**



## 6.) Who Wants to be a Millionaire?

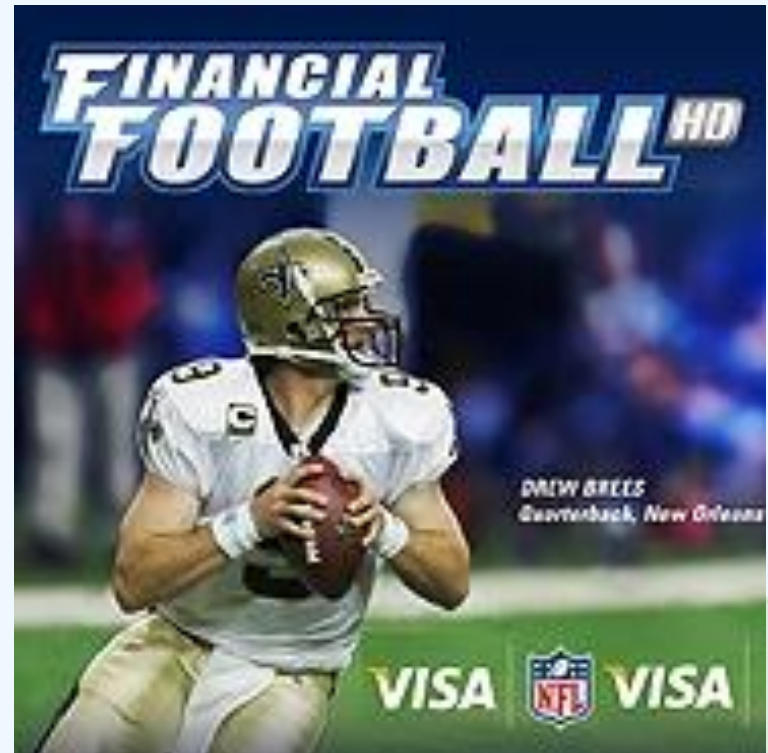
- Middle and High School
- Team trivia challenge
- Debunking myths about the education, lifestyle, and financial behaviors of the wealthy.
- Partnered with NKU's Center for Economic Education





# 7.) Financial Football

- New App
- Soccer available
- Lesson Plans for K-12
- *Financial Football features questions of varying difficulty throughout the game. Like football, successful financial management requires strategy, finesse and endurance.*
- [www.moneysmartweek.org](http://www.moneysmartweek.org)



# 8.) Choconomics

- Great for class visits
- Best with Middle School
- Concepts:
  - Addition, Subtraction
  - Multiplication/Division
  - Scarcity
  - Fair Trade
  - Economics



# Beyond 40 Programs: Family Programming

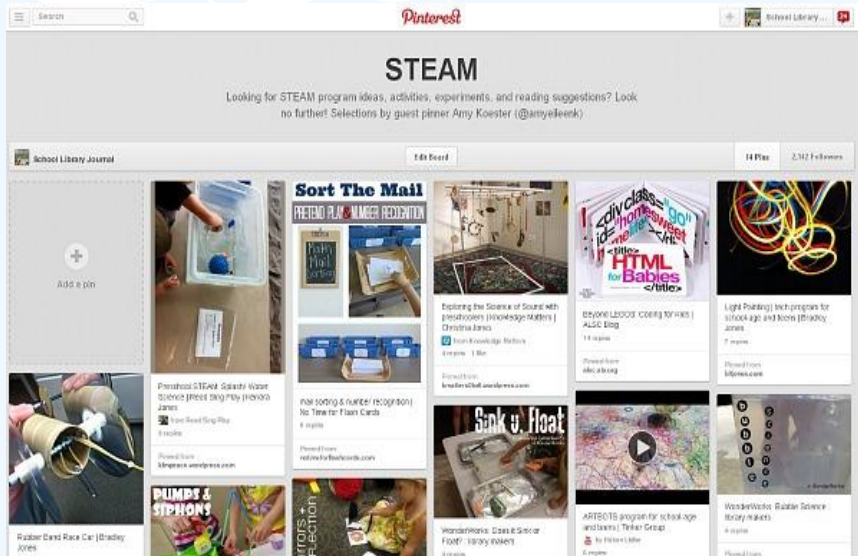
- Family Festivals:
  - Quartlery
  - Drop-in Stations
  - STEAM Themes
- Money Matters Meal Night
- Lego Club
- Makerspace
- Teen Tech Team





# For more resources...

## SLJ STEAM Pinterest Board



## Design Squad Nation



<http://www.pinterest.com/sljournal/steam/>

<http://pbskids.org/designsquad/>



# Questions?

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